storing master characteristic information associated with at least one genuine bill from each of at least two currency systems. A signal processor compares the retrieved characteristic information with master characteristic information associated with at least one genuine bill. The signal processor generates an indication of the identity of said bill based on the comparison when the bill is one that the system is capable of identifying.--

IN THE CLAIMS:

Claim 18, please change "no greater" to --less--.

REMARKS

Claim 18 is amended to change the expression "no greater than" to "less than," overcoming the rejection under 35 U.S.C. § 112. The Abstract of the Disclosure has been rewritten to overcome the matters noted by the Examiner. The Examiner's helpfulness in this regard is appreciated.

35 U.S.C. § 112 Rejections

The claims stand rejected under 35 U.S.C. § 112, second paragraph, the Examiner specifying a number of objections to the terminology used in the claims. Claim 18 has been amended hereinabove to overcome this rejection. However, regarding the remaining claims, reconsideration is requested.

Upon reconsideration, with respect to the rejections under 35 U.S.C. § 112, it appears that these have three components, namely that the term "not substantially more than about" are 1) a negative limitation; 2) a relative term and 3) not supported by the specification. With regard to the first contention, the use of the word "not" does not necessarily render the limitation a "negative" one. Since these dimensions are supported by the specification, as will be more fully discussed below, it is submitted that this choice of terminology is acceptable, since it clearly defines the apparatus disclosed. "[N]egative limitation per se, do not necessarily fail to define the invention," and "may be the least cumbersome way to express the limitation." *In re Bankowski* 138 U.S.P.Q. 75 (CCPA 1963).

Regarding the use of the terms "about" and/or "substantially," such terms have been long held permissible and not too vague to satisfy the definiteness requirement of 35 U.S.C. §

112. See for example *Andrew Corp. v. Gabriel Electronics, Inc.*, 6 U.S.P.Q. 2d 2010 (Fed. Cir. 1988), holding that the law does not support the position that one of ordinary skill in the art would not know when radiation pattern envelopes were "substantially" equal. Similarly, in the present claims, it is clear to one of ordinary skill in the art when a dimension or measurement is not "substantially more than about" a stated dimension or measurement. "Nor does the use of the word 'substantially' . . . make the claim indefinite." *Deering, Milliken & Co. v. Temp-Resisto Corp.*, 116 U.S.P.Q. (S.D.N.Y. 1958) citing the Supreme Court decision in *Eibel Process*, 261 U.S. 45, 66 (1923). The Federal Circuit reached a similar conclusion in *W. L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 316 (Fed. Cir. 1983), cert denied, 469 U.S. 851 (1984): "The descriptive term 'about' . . . does not render a claim indefinite under 35 U.S.C. § 112." See also *Ex parte Eastwood*, 163 U.S.P.Q. 316 (P.T.O. Bd. App. 1968).

Support in the Specification and Drawings

Finally, the rejection appears to contend that the claim is in some manner not supported by the specification. However, it is submitted that there is ample support in the specification for the claims as filed and for the novel feature of the relatively compact size of the currency evaluation device as claimed in this application. This support is found in both the description and the drawings, as follows:

1. The Background at page 2, lines 18-28 establishes the drawbacks of large size machines and the need for smaller size machines for use in confined areas such as teller areas.

2. At page 10, lines 25-31 it is a stated "object" of the invention to provide a machine which is "compact."

3. At page 61, lines 23-31 the input hopper 209 and its sidewalls 210a, b are described. These elements are shown in FIG. 1. It is believed clear from the description and drawings that the cross-sectional dimensions of the area defined by the hopper 209 would not be significantly larger than the width and length of the bills to be accommodated by the device.

4. At page 62, lines 10-25, the stacker plate 214 and the output receptacle 217 are discussed. These elements are shown in FIG. 1. One of ordinary skill should understand from the description and drawings that the widths of these elements would not be much

greater than the width of a bill. Also, it would be understood that the distance between outer edges of the stacker wheels 212, 213 would be less than the width of a bill, so that these would contact the bills as described.

No 5. At page 65, lines 17-25, the distance between the axes of the two driven transport rolls (223 and 241) is described as "just short of" the length of the narrow dimension of the currency bills.

No 6. At page 63, lines 16-18, the circumference of the drive roll 223 (i.e., of outermost portions of its grooved surfaces 228, 229) is described as greater than the width of a bill. This offers an alternate known dimension which could be used to measure the dimensions, as noted further below.

No 7. The width of the support member 281 in FIG. 23 must be at least as great as the longer dimension of a bill, yet the distance between the outer edges of the rollers must be less than this dimension, which should also approximately equal the width of the input receptacle 209 and output receptacle 217. This measurement (width of member 281) is just short of 7½ inches on FIG. 23, indicating that FIG. 23 is approximately to scale (i.e., 1:1).

This plate or support member 281 is the plate which is shown just inside of the output area of the machine in FIG. 1 with the two projecting rollers being the rollers 251 which are generally aligned with the output "stacker wheels" 212, 213. Thus, a dimension of approximately 7½ inches across the interior or "bill pass" portion of the machine, as well as across the output receptacle 217, is disclosed.

No 8. At page 86, lines 2-3, an example of the length of a linear array scanhead 1152 is given as 7 inches. Since the scanhead would be approximately centered relative to the support members such as the support member 281 of FIG. 23, this is consistent with the width of the support member 281 being approximately 7½ inches, as discussed above (#7), i.e., its actual measurement on FIG. 23.

No 9. At page 78, line 30, the description states that the scanner "has been described in connection with scanning U.S. currency." Thus, the length and width dimensions of a U.S. bill can be used to convert some of the "bill" width or length dimensions noted above to inches. U.S. bills are approximately 6.1 inches long and 2.56 inches wide.

10. Page 93, lines 20-29 gives the dimensions of Canadian bills (6 inches by 2.75 inches) and German bills (from 5.12 inches by 2.36 inches up to 6.3 inches by 3.15 inches), and also notes that the input hopper is wide enough to accommodate all of these bills, "e.g. 6.3 inches wide" (page 93, line 29).

Using as a "ruler" the distance between the axes of the rollers 223 and 241 (just short of a narrow dimension, i.e., width of a bill, see #5 above) some other measurements can be made on FIGS. 19-22 (see enclosed, marked copy of FIG. 19). The distance between the axes of rollers 223 and 241 can be approximated as 2.3 inches (to accommodate the smallest dimension bill mentioned - German bills of 2.36 inches width). The following overall depth and height dimensions of the unit as shown in FIG. 19 can be calculated using this "ruler," as shown in the attached copy of FIG. 19. Scaling FIG. 19, the distance between the axes of the elements 223 and 241 is approximately 1.5 inches. Let this be measurement L. The depth (D) (to the outermost extending lip of the hopper 217) is approximately 7.5 inches equals 5L, or not substantially more than about 5 times the smaller cross-sectional dimension L, as stated in claim 2. In inches depth (D) becomes 5 x 2.3 = 11.5 inches. The overall height of the machine in FIG. 19 measures about 5.5 inches. $^{5.5}/_{1.5}$ x 2.3 = 8.43 inches, or not substantially more than about 4 times ($^{5.5}/_{1.5}$ = 3.66) the smaller cross-sectional dimension L, as stated in claim 1.. Using a U.S. bill (W = 2.56 inches) let L = 2.5 inches, these measurements become depth = 12½ inches and height = 9.166 inches.

Scaling FIG. 1, and based upon the width (L2) of the input area being 6.3 inches (as at #10 above), this scales to approximately to 2.2 inches on FIG. 1 whereas the overall width of the machine scales approximately to 3½ inches. $^{3.5}/_{2.2}$ x 6.3 gives a width dimension of approximately 10 inches in FIG. 1. Alternatively, based on a width (L3) of 7.5 inches across plate 281, as in #7 and #8 above (plate 281 is the flat surface shown just inside of the output elements 212, 213), L3 measures about 2.625 inches. The overall width on FIG. 1 becomes $^{3.5}/_{2.625}$ x 7.5 = approximately 10 inches, in agreement with the above, or not substantially more than about 2 times the larger cross-sectional dimension of the smallest bill (German 5.12 inch) as in claims 3 and 4.

The enclosed copies of FIGS. 1 and 19 of the drawings, have red scaling marks added, based upon the description in the specification, to indicate the approximate length, height and width of the illustrated device, as discussed above.

It is clear that the above dimensions, H = 8.4 to 9 inches, D = 11.5 to 12.5 inches and, W = 10 inches support the claims calling for height of not substantially more than about 10 inches, depth not substantially more than about 12½ inches and width of not substantially more than about 10 inches (i.e., claims 14-17, 28-29 and 31-33), as well as the claims calling for "footprint" and "volume" measurements (claims 27-33). The claims calling for measurements in terms of multiples of bill dimensions are also supported, as noted above.

Accordingly, it is believed that the foregoing remarks overcome the rejections under 35 U.S.C. § 112.

35 U.S.C. § 103 Rejections

All the claims further stand rejected under 35 U.S.C. § 103(a) over *Roes et al.*, U.S. Patent No. 4,587,434. Reconsideration of this rejection is requested in view of the remarks which follow.

In the statements of reasons for the rejections the Examiner has stated that *Roes* does not explicitly teach a number of elements, particularly the limitations in the various claims regarding the dimensions of the housing. However, the Examiner states that it would have been obvious to one of ordinary skill in the art to do so because it is a "design choice." All of the rejections of record rest on this assertion. However, this "design choice" is nowhere given in the *Roes* patent, nor has the Examiner pointed to any other prior art references which would give this "design choice" to one of ordinary skill in the art. The phrase "design choice" appears nowhere in 35 U.S.C. § 102 or 35 U.S.C. § 103. This is not an authorized ground of rejection under the Statute. See *Ex parte Haas et al.*, 144 U.S.P.Q. 98 (PTO Board of Appeals 1964). Moreover, the Examiner is required to support any opinion such as this with facts. See *In re Warner and Warner*, 154 U.S.P.Q. 177 (CCPA 1967).

The Patent Office Board of Appeals stated long ago "the Examiner then says that these are a matter of choice. It is not a matter of choice presented by the prior art. The prior art gives only one choice; a process which will not yield these new and improved results. Thus, one of ordinary skill in the art, turning to the prior art to make his choice, would never arrive at the claim process." *Ex parte Haas, Connolly and Van Voorhis*, 144 U.S.P.Q. 98 (1964). More recently, the Court of Appeals for the Federal Circuit overturned a board

decision rejecting a claim as being a matter of "design choice." *In re Chu*, 36 U.S.P.Q. 2d 1089 (Fed. Cir. 1995).

Therefore, this grounds of rejection ("design choice") has no factual support in the record (i.e., the claimed "choice" is not present in the art of record) as required by such cases as *In re Warner* (supra), cited with approval by the Federal Circuit in *In re GPAC Inc.*, 35 U.S.P.Q. 2d 1116, 1123 (Fed. Cir. 1995).

Moreover, *Roes* fails to meet the claims in a number of respects. For example, *Roes* is a validator, and not a currency evaluation device for identifying currency bills of different denominations as called for in all of Applicants' claims. Nowhere does the *Roes* disclosure suggest that it is capable of identifying currency bills of different denominations. In fact, the description suggests otherwise. For example, in column 10, last line through column 11, line 4, the *Roes* patent states "the program set forth in Table I is specifically adapted for determining the validity of a British 1 pound note. As already mentioned, the apparatus can be modified to accept currency notes from various countries and in various denominations." (emphasis added) However, *Roes* fails to teach any details of the modifications which would be required.

Thus, not only does *Roes* fail to identify the bills ("validating" is not the same as "identifying") but it also fails to handle notes in various denominations (as called for in all of Applicants' claims) or from various countries as called for in Applicants' claims 34-35 without modifying the apparatus. As indicated at column 11, lines 2-4 of *Roes*, the device is not capable of identifying bills of a plurality of currency systems or even of "validating" bills from a plurality of currency systems. The *Roes* patent is devoid of any description of how currency notes are handled following the validating process. It may well be that the validator would forward notes to yet another apparatus for denominating, identifying, counting, or the like. However, the *Roes* patent itself does not disclose any of these operations or functions. Since the *Roes et al.* device is not capable of discriminating or denominating bills, it cannot be fairly stated as the Examiner states in Paragraph 6 of this Office Action, for example, that the PIN diodes comprise "a discriminating unit."

The foregoing apply to all of Applicants' claims. Following are some further observations regarding additional reasons for allowability of individual claims or groups of claims, in generally the same order in which they are addressed in the Office Action.

Regarding claim 10, it is clear that *Roes* transports the bills lengthwise, rather than along a transport path which is "at least as wide as the widest type of bill the system is designed to discriminate."

Regarding claim 11, it is clear that the *Roes* patent teaches a very slow apparatus, having no ability to operate at the speed claimed by Applicant "about 1,000 bills per minute." For example, in column 3, lines 5-8, *Roes* states that the illustrated embodiment of the invention is capable of processing a currency note "in less than two seconds" (see also col. 14, lines 52-54). In contrast, Applicants' claimed speed of 1,000 bills per minute (in claim 11) would translate to processing each note in approximately .06 seconds.

With respect to the Examiner's example in the second reason given for obviousness at page 5 of the Office Action, "the transport means of the housing in *Roes* is capable of accommodating the various widths of currency notes, etc.," the undersigned is unable to understand how the mounting of guide rails or substitution of a different entrance bezel to accommodate lesser width notes is related to the dimensions of the housing. It is the dimensions of the housing which are at issue in this particular reason for rejection.

Regarding claim 18, the characterization of pulleys 26 and rollers 22 of *Roes et al.* as being somehow suggestive of the spacing between rollers called for in claim 18, or of the last drive wheel 22 of *Roes* as being somehow the same as a "stacker wheel" as set forth in claim 18 would appear to be without support. As stated above, the bill is transported lengthwise in *Roes*, and therefore, there is no basis to assume that the spacing between wheels 22 in *Roes* is in any way related to "the narrow dimension of a bill" as called for in claim 18. *Roes* is devoid of any teaching in this regard.

The stacker wheels and their function are more fully described at page 62 of Applicants' specification and as shown in FIGS. 19 and 20 of the drawings. Among other things, the stacker wheels are described as having flexible blades which deliver bills into an output receptacle at the forward end of the stacker plate. It is submitted that the drive wheels of *Roes* do not have any of the structure or function of Applicants' stacker wheels as described and claimed, and moreover, as further noted below, *Roes* does not even suggest a bin or output receptacle into which bills may be delivered, thus being devoid entirely of the function provided by Applicants' stacker wheels.

Regarding the limitations (in claim 18) of the input bin and the output bin, clearly, the bezel 20 of *Roes* cannot possibly suggest a "bin" to one of ordinary skill in the art. Similarly, the mere fact that the bills must exit the *Roes* device at some point seems to have no bearing on the question of whether the *Roes* patent suggests "an output bin" to one of ordinary skill in the art. To the contrary, it would appear that the *Roes* device is intended for use on fare collection devices or other systems "which accept payment in the form of paper currency in return for goods or services" (see column 1, lines 38 and 50-54). Clearly, in such systems, the notes or bills fed into the machine would be retained within the machine, and not returned to an output bin. Moreover, *Roes* specifically provides for a small plastic hook 34 (see column 4, line 22-28) to prevent the note from being pulled back out of the apparatus. Thus, it is clear that *Roes* specifically teaches away from feeding the notes to an output bin.

Regarding claims 7 and 21, *Roes* does not appear to teach storing master patterns for identifying bills as claimed by Applicant, but mentions only "acceptance band data" for validating bills which fall within a certain range of acceptable reflectance characteristics, see *Roes*, col. 12, lines 7-22.

Regarding claims 8 and 22, the cited portions of *Roes* (column 12, lines 7-19 and column 15, lines 19-63) say nothing about laterally displaced scanned patterns or laterally displaced master patterns. Accordingly, this rejection would appear to be without support. In fact, the *Roes* disclosure appears to be devoid of any teaching whatever of the ability to use laterally displaced patterns of any sort for comparison. As noted above, the *Roes et al.* disclosure teaches only "acceptance bands" and not "master patterns" and thus, cannot possibly be said to teach "laterally displaced master patterns."

Regarding claims 9, 12, 23 and 26, while *Roes et al.* does disclose measurement of the length of a note in part by detecting the leading edge of the note (columns 7, lines 11-20 stated by the Examiner), *Roes* does not teach that scanning of a segment of a bill is to begin at a predetermined distance inboard of a leading edge of the bill or teach any means for accomplishing this, as called for in these claims. Thus, *Roes* does not anticipate or render obvious claims 9, 12, 23 and 26. Nor is there any disclosure whatever in *Roes* of storing master patterns associated with scanning beginning at, before, or after certain predetermined distances from a leading edge of the bill as set forth in these claims. As noted above, *Roes et al.* does not teach the use of "master patterns."

Regarding the speed in excess of 1,000 bills per minute, the contention that this is a design choice has been answered hereinabove. Briefly, no such choice is provided by the *Roes et al.* patent. The 21.6 cm per second transport speed of *Roes* (see col. 4, line 19) when used to scan U.S. currency, for example, would result in a rate of less than 80 bills per minute. Note in this regard that the *Roes* device scans bills lengthwise, and that the length of U.S. currency is 15.5 cm. (Allowing for a .5 cm spacing between successive bills, 21.6 cm/sec. ÷ 16.5 cm/bill x 60 sec./min. = 78.5 bills/min.) However, it is also clear that the context in which the *Roes* apparatus is used, that is, fare collection and vending machine type of applications, that there is no reason to anticipate that any particular number of bills will be handled in a given period of time, but only that an individual bill will be handled within a reasonable amount of time, hence the reference to taking "no more than about 2 seconds" to validate a bill which is repeated at two points in the *Roes* specification as mentioned above.

Regarding claim 27, since the *Roes et al.* device appears to be expected to be a part of a larger machine, it would appear that the dimensions of the *Roes et al.* device itself are not relevant, but rather the dimensions of the larger machine of which it is a part would be relevant. However, these are nowhere stated in the *Roes et al.* specification. Clearly, the "footprint" of the *Roes et al.* device would be of no relevance to the use of the larger machine of which it is a part, i.e., a fare collection device or vending machine.

Regarding claims 28-34, the Examiner has given no reason for the rejection other than "design choice" and this has been answered above.

Regarding claim 35, as mentioned above, it is clear that the *Roes* device does not have any means for designating one or more of two currency systems, since as mentioned above, the *Roes* disclosure clearly states that the apparatus must be modified to accept currency notes from various countries and in various denominations (column 11, lines 2-5). However, *Roes* does not teach any details of such modifications.

In view of the foregoing amendments and remarks, it is believed that the claims as presently submitted are in condition for allowance and favorable action to that end is therefore requested.

The Commissioner is authorized to charge any fees which may be required to Deposit Account No. 19-3875, Order No. CUMM139--1.

Respectfully submitted,

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